CP-3 Environmental Assessment

THE
NAVAJO
NATION

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ENVIRONMENTAL ASSESSMENT

CAMERON AML RECLAMATION PROJECT 3
ABANDONED MINE LANDS PROJECT
Coconino County, Arizona

Prepared by

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In Cooperation with

U.S. Department of the Interior
Office of Surface Mining Reclamation and Enforcement
Albuquerque Field Office
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A. DESCRIPTION OF THE PROPOSED ACTION

The Navajo Abandoned Mine Lands Reclamation Department (NAMLRD) proposes to eliminate the hazards and environmental problems associated with eleven non-coal abandoned mine land (AML) sites in eight problem areas, near Cameron, AZ. The sites (mines) included in this proposal were abandoned prior to the enactment of Public Law 95-87, the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The Priority 1 hazards at the project sites spread over 287 acres, include about 15,344 feet of dangerous highwalls (DH), 10 impoundments with polluted water being used for agricultural/industrial purposes (PWAI) and 127 acres of dangerous piles or embankments (DPE). Local residents and their livestock face a significant risk of personal injury, as well as exposure to low level radiation emission at and near project sites. In addition, surface water runoff flow through some wastepiles potentially carrying with it dissolved heavy metals, radionuclides and other pollutants. All project sites are easily accessible to people, livestock and wildlife. There is much evidence of visitation to the sites.

The proposed action will effectively mitigate the dangers and environmental problems mentioned above. The open pits will be backfilled with mine waste materials. Backfilling work will be accomplished in accordance with methods approved by the NAMLRD's Professional Engineer. Radioactive material will be confined between layers of relatively less radioactive or non-radioactive waste material to reduce the radiation levels to within NAMLRD's recommended guidelines. Highwalls will be eliminated by backfilling the open pits or by reducing the highwall slopes to 3h:1v, except where the natural adjacent slopes will not allow it. The polluted water will also be eliminated by the backfilling work. Surface water runoff will be diverted away from the reclaimed areas, and the reclaimed surfaces will be graded and contoured to blend with the surrounding topography and to provide drainage away

from the reclaimed area.

The NAMLRD has obtained a $2,645,505 federal construction grant from the Office of Surface Mining Reclamation and Enforcement (OSMRE), Albuquerque Field Office (AFO) to implement a reclamation project to accomplish the proposed action stated in this Environmental Assessment. The NAMLRD requests OSMRE, AFO Director to issue an authorization to proceed with the proposed reclamation construction project.

B. NEED FOR THE PROPOSED ACTION

The need for the project to be carried out stems from uranium mining that took place in the Cameron area in the 1950's and 1960's. The mines were abandoned and left without adequate reclamation prior to August 3, 1977 and these AML sites continue to degrade the quality of the environment, prevent and damage the beneficial use of land and water resources, and endangers the health and safety of the Navajo Nation public and its visitors to this scenic area encompassed in the larger Painted Desert region of Northern Arizona. Through interviews during the collection of Consent to Entry for Reclamation, the writer was advised by landusers and homeowners living in the Cameron AML area of property loss due to the muddy conditions within the open pits. Livestock have become bogged down in the clayey mud, and if not saved by the owner or others, the animals die or become prey to predators.

The Cameron AML Reclamation Project 3, will address 11 abandoned open pit uranium mine sites scattered over 8 problem areas. The sites and their AML priorities to be addressed are listed in Table 1.

TABLE 1: LIST OF AML PRIORITY ONE HAZARDS TO BE ADDRESSED IN CP3

Site No.	Site Name	Total Acreage	DH (ft)	PWAI (cnt)	DPE (Ac)
NA-0155a	Charles Huskon No. 10	25.92	1,785	1	14.13
NA-0155b		12.38	50	-	1.81
NA-0163	Ryan No. 1	7.51	263	1	3.73
NA-0166	Charles Huskon No. 11	25.36	1,380	1	5.79
NA-0172a	RAMCO No. 21	15.29	1,937	1	9.97
NA-0172b		18.76	1,417	1	7.45
NA-0173	RAMCO No. 22	20.25	1,665	1	7.43
NA-0174	RAMCO No. 20	15.11	-	2	6.39
NA-0175	Ryan No. 2	105.83	5,253	1	55.60
NA-0179	Yazzie No. 1	7.89	100	-	3.14
NA-0180	Yazzie No. 2	32.60	1,494	1	11.51
	TOTALS	286.90	15,344	10	126.95

The Cameron AML Reclamation Project 3 will address all the physical and environmental hazards mentioned earlier to fulfill the goals and objectives of SMCRA and the Navajo Nation,s Abandoned Mine Lands Reclamation Plan.

C. ALTERNATIVES CONSIDERED:

Alternative 1: Issue an authorization to proceed with the proposed project.

Under this alternative, the OSMRE, AFO Director would issue a Finding Of No Significant Impact (FONSI) for Cameron AML Reclamation Project 3 using Alternative 1 to accomplish the goals of the proposed action.

This project includes the backfilling and regrading of 11 abandoned open pit uranium mine sites near Cameron, AZ, using methods approved by NAMLRD's Professional Engineer.

Backfilling will involve selective handling. Wastepile materials with little or no radioactivity will be used as a buffer on and above the pit floor. Radioactive wastepile material will be

"sandwiched" between the buffer zone and the top layer of wastepile material with no or near-background radioactivity. Selective handling is based on radiological surveys of the sites prior to and during construction and approved by NAMLRD's Health Physicist. Post-reclamation radiological surveys will be conducted to determine if there are any radiological "hotspots" left. If there are any, additional layer(s) of clean material will be put on these areas to reduce or eliminate the "hotspots." All work will be done in compliance with NAMLRD's "Health Physics and Instrumentation Monitoring Plan." See Appendix E.

Diversion berms and ditches will be constructed, as needed, to divert surface water runoff away from reclaimed areas. All final grades and slopes will be 3h:1v, unless adjacent natural topography will not allow it. Existing access roads leading to each project area will require upgrading to facilitate the transport of mine waste material, supplies, fuel, equipment, and personnel. Roads that are no longer needed will be removed at the completion of the reclamation work.

At the time of final grading, shallow indentations will be imprinted in the soil to help reduce rill erosion, to break up long slopes and allow for soil to be deposited by the wind. Terracing or scarification of slopes will be implemented, if deemed necessary, for extremely long slopes to further reduce erosion trends.

The open pits hold water and therefore serve as a water source for livestock and wildlife. Replacement water sources will be provided by the repair and maintenance of two existing silted-up water catchment ponds. At one site, a broken earthen dike will be repaired and the catchment area will be dredged of silt material. At a second site, the spillway will be repaired and the catchment area dredged of silt material. The dredging of the silted material

will only be done if the conditions are dry within the catchment area. The two existing water sources are within a mile or less of the project sites (see Map No. 2 for location of catchment ponds) and will serve as replacement water sources for pits NA-0163 and NA-0174 that have been observed to be water sources for livestock and wildlife.

At site NA-0166, about 5,000 cubic yards of stockpiled ore which originated from NA-0166 was deposited on lands adjacent to the Navajo Nation; this land is owned by the federal government and is administered by the Bureau of Land Management, however the surface rights have been withdrawn by the Bureau of Reclamation. This stockpiled ore will be deposited back into the pit. Preliminary consultation has been made with the U.S. Bureau of Reclamation, Lower Colorado Region (USBR-LCR) in Phoenix, AZ as to the possibility of returning the stockpiled ore to the pit. The USBR-LCR sees no problems with returning the stockpiled ore to the pit. A permit will be obtained from the USBR-LCR, Arizona Projects Office Realty Services. Per the Arizona Projects Office Realty Services representatives all costs and fees for issuing the permit will be waived in exchange for NAMLRD's reclamation of the stockpiled ore. Borrowing of top cover material, if necessary, will be permitted from the federal land for use in the reclamation work.

Alternative 2: Do not issue an authorization to proceed with the proposed project [No Action].

Under this alternative, the OSMRE, Albuquerque Field Office Director will disapprove the proposed action, described under Alternative 1, and thus, the proposed reclamation construction work estimated to cost $2,645,505, cannot be implemented by NAMLRD. As a result, 287 acres of mining impacted land that qualify for

reclamation under SMCRA will be left unreclaimed, 127 acres of uranium mine waste will remain on the surface, 10 impoundments of polluted water being used for agricultural purposes will remain, 15,344 feet of dangerous highwalls will remain, 11 open pit uranium mines will continue to attract livestock and human visitation, and the potential for property loss will continue.

In addition, the No Action alternative will not eliminate the safety hazards, nor reduce the environmental degradation that is incidental to the radioactive nature of the wastepiles and the stockpiled ore. Since pastoralism is the predominant lifestyle of the local residents, access into and subsequent visits to the extremely hazardous abandoned open pits will continue. The site features will continue to impede the scenic vistas.

The conditions of the dangerous highwalls, dangerous polluted impoundments and the water and air pollution from the radioactive wastepiles will worsen with time. Segments from the highwalls will continue to collapse causing rocks to drop from them, and steep and unstable wastepiles will continue to erode and contaminate surface water runoff, stream beds and downstream bodies of water.

Alternative 3: Other reasonable alternative(s).

Other alternatives which could be used to eliminate or reduce some safety hazards and environmental harm are fencing or berming off the problem areas. Employing these alternatives, will neither eliminate nor reduce the safety hazards and the associated environmental problems. These alternatives will, at best, be short term and will not return the affected land to effective and beneficial use.

Fencing (Chain Link or Barbed Wire): Activities will consist of setting up uniformly spaced steel posts with or without concrete bases. Fencing material will be securely fastened to line posts and corner posts. Employing this alternative will prohibit access by livestock, but does not allow for reclamation of the Priority 1 problems. This will be a temporary solution to the problems. The fence will not prevent wildlife access to the dangerous open pits and polluted waters, nor will it prevent human access to the highwalls and other dangerous features. Fencing will not prevent the further accumulation of water in the open pits. Safeguarding the fence or the integrity thereof in remote areas will be costly. The fences may be damaged or worn causing easy access to unsafe areas. Environmental degradation incidental to the radioactive nature of the wastepiles and the stockpiled ore will continue. The fences will require periodic monitoring and replacement, as theft and vandalism are highly probable.

Berming Off Mine Pits: This alternative will consist of 6 foot berms made of mine waste materials around the dangerous features of the problem areas. This alternative will prevent water from entering and accumulating in the open pits for only the short term. Water will still collect in the pits from rain that falls in the immediate area of the pit. But like Alternative 2, this is not a permanent solution to the problem, for the berms will be susceptible to erosion and will require periodic maintenance, and will not address the hazards of the AML features except reduce the amounts of polluted water collected in the pits.

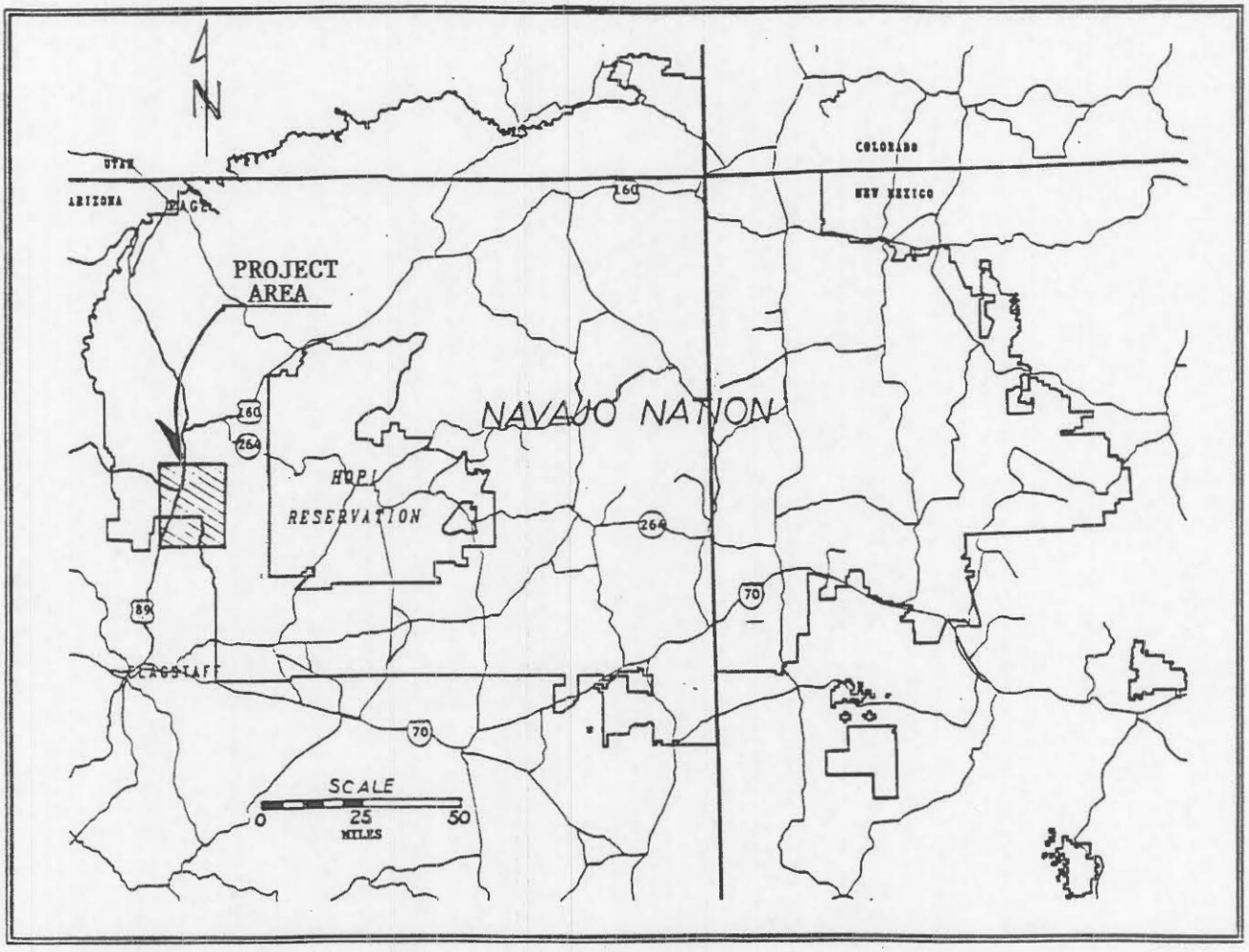
D. AFFECTED ENVIRONMENT:

1. General Setting

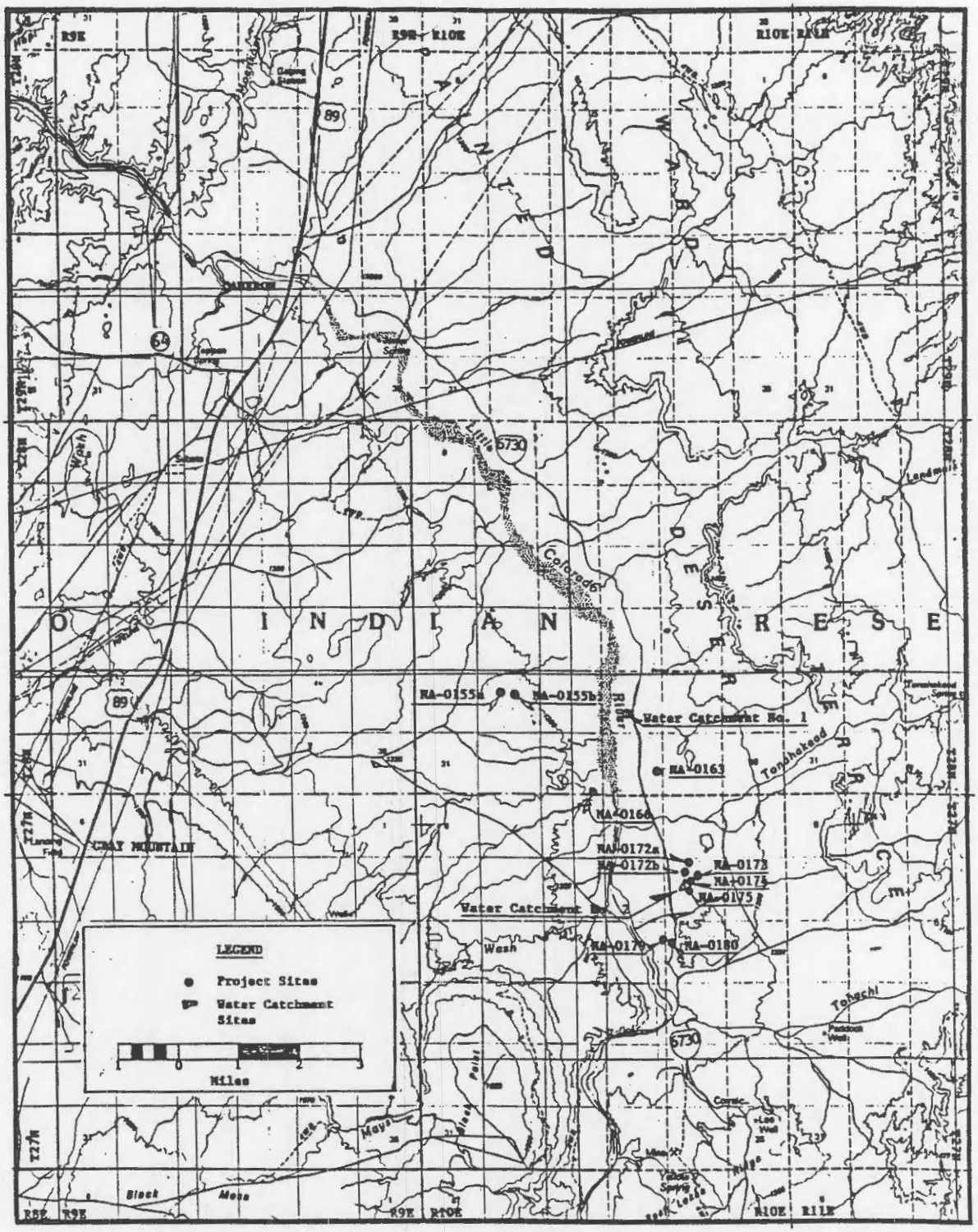
The area around Cameron was intensively explored for uranium in the 1950's and 1960's, resulting in the development of over 100 uranium mines and occurrences. Of these, 85 were developed and registered some production of uranium ore. Ten of these mines were on private, state owned, or other federally owned lands. The remaining seventy-five (75) inactive uranium mines are on the Navajo Nation's land in the Cameron area. Of the 75 mines, six were reclaimed during Cameron AML Project 1 (CP1), and eleven (CP2) are presently being reclaimed. Nine mines are included in this project, and fifty-one mines (CP4, CP5 & CP6) are being planned for reclamation in the future. The Land and mineral rights in the area are held in trust for the Navajo Nation by the United States. Current land uses in the area include livestock grazing, residential, wildlife habitat, tourism, roadside businesses and some farming.

The Cameron AML District occupies a portion of the broad valley between the Ward Terrace and the East Kaibab Monocline in North-central Arizona. The district straddles the Little Colorado River, which is ephemeral in this reach. The river runs from the southeast to the northwest in this reach. Additional information on the geology of this area is contained in "Results of the Third Paleontologic Field Survey of Abandoned Uranium Mine Sites in the Navajo Nation Near Cameron , Arizona". See Appendix B.

The area is approximately 24 miles east of the Grand Canyon, and 50 miles north of Flagstaff. The area is in the rain shadow of the San Francisco Peaks, the Coconino and Kaibab plateaus, and the Mogollon Rim, resulting in an annual rainfall of about 5.13 inches (Reichenbacher, 1986). As a result, vegetation is sparse and developed soils are negligible or non-existent. Ground surface consists mainly of weathered rock (shale) outcroppings, resistant rock (sandstone) outcroppings, eolian dune sands, and alluvial



MAP NO. 1: PROJECT LOCATION MAP. Map shows location of Cameron AML Reclamation Project 3.



MAP NO. 2: SITE LOCATION MAP. Map shows location of Cameron AML Reclamation Project 3 sites and the location of the two earthen water catchments to be repaired. Map reproduced from USGS 30 x 60 minute Quadrangle of Cameron, Arizona, 1982.

deposits in ephemeral washes. Most of the surface material around the actual pits is heavy clay, weathered from the shale of the Chinle Formation.

Native grasses and plants are established in the eolian sands and in other areas where there is cover to provide protection for the developed soils. The washes and other riparian areas have been colonized by two exotic invader species, tamarisk (*Tamarix sp.*) and camelthorn (*Alhagi camelorum*).

At the mine sites, the ground surface is invariably barren rock and clay. Due to the arid conditions of the region and the nature of the waste rock, little natural revegetation has occurred. Each mine site consists of a pit or surface excavation, and one or more associated wastepiles. The wastepiles consist either of rock that was removed from the mine in order to reach the ore, or mineral-bearing rock that was deemed too costly to process.

The AML sites are located near the western edge of the Navajo Nation, near Cameron, AZ. The 11 sites range in location from 7.25 miles southeast of Cameron to 12.0 miles southeast of Cameron. Table 2 shows the location and land status of the 11 sites (see Cameron AML 3/Landstatus in Appendix A for additional information):

TABLE 2: LOCATION AND LAND STATUS OF CP3 PROJECT SITES

SITE	SECTION, TOWNSHIP & RANGE*	LAND STATUS	USGS 7½' QUAD
NA-0155a	N½ Sect. 29, T28N, R10E	Trust Land	Cameron SE
NA-0155b	N½ Sect. 29, T28N, R10E	Trust Land	Cameron SE
NA-0163	NE¼,SE¼ Sect. 34, T28N, R10E	Trust Land	Cameron SE
NA-0166	S½,SE¼ Sect. 33, T28N, R10E	Trust Land	Cameron SE
NA-0172a	NW¼ Sect. 11, T27N, R10E	Trust Land	Wupatki NE
NA-0172b	NW¼ Sect. 11, T27N, R10E	Trust Land	Wupatki NE
NA-0173	N½ Sect. 11, T27N, R10E	Trust Land	Wupatki NE

TABLE 2: LOCATION AND LAND STATUS OF CP3 PROJECT SITES (Continued)

SITE	SECTION, TOWNSHIP & RANGE#	LAND STATUS	USGS 7½' QUAD
NA-0174	NW¼ Sect. 11, T27N, R10E	Trust Land	Wupatki NE
NA-0175	NE¼,SE¼,SW¼ Sect. 11, T27N, R10E	Trust Land	Wupatki NE
NA-0179	E½,NE¼ Sect. 15, T27N, R10E	Trust Land	Wupatki NE
NA-0180	W½,NW¼ Sect. 14, T27N, R10E	Trust Land	Wupatki NE

#unplatted & projected Range and Townships, Gila and Salt River Meridian, except for NA-0155a&b and NA-0166, which are platted.

The reclamation work is expected to take about 10 months to complete. The proposal will reclaim about 287 acres of AML lands containing the following: 11 abandoned uranium open pits with an aggregate area of about 64 acres, about 127 acres of radioactive wastepiles, 10 open pits with polluted water (now being used by livestock and wildlife), and 15,344 feet of dangerous highwall.

After reclamation, future land uses of the project area will include wildlife habitat, livestock grazing, and scenic vistas. Historic resources are represented by the actual mines themselves.

2. Other Affected Resources, including Special Areas of Consideration

a. Historic and Cultural Resources: Cultural resource issues in the area are represented by historic and prehistoric use by Native Americans (See archaeological report). The data collected for the archaeological and ethnographic reports have served to document the full extent of historic resources and to obtain approval of "No Effect" from the Navajo Nation Historic Preservation Office. A copy of the Cultural Resources Compliance Form has been provided to the Arizona State Historical Preservation Office notifying them that no historic properties were found.

In addition to the common historical and cultural resources, paleontological resources are represented by various fragments of fossilized material in the wastepiles at several sites. It has been recommended that paleontological monitoring take place at sites NA-0155a, NA-0172a&b, NA-0173 and NA-0175. During the initial survey, all surficial fossil material of scientific significance that were found were collected, catalogued, stored and are held in trust for the Navajo Nation by the Museum of Northern Arizona, Flagstaff, AZ. See Appendix B and **1. Resources Values: a. Historic, Cultural, and Paleontological.**

b. Hydrology: The mine pits in their present condition collect rainwater and surface water runoff. Analysis of the water in the pits reveal elevated levels of radionuclides from the interaction with uranium minerals near the pits. According to the United States Geological Survey Water-Resources Investigation Report 93-4226, "Geohydrology and Water Chemistry of Abandoned Uranium Mines and Radiochemistry of Spoil-Material Leachate, Monument Valley and Cameron Areas, Arizona and Utah," "The smaller radionuclide activities in pit water and well and spring water, relative to activities in shallow ground water, may represent background levels of those constituents for the area. Data from this study, however, were not sufficient to determine representative background levels."

Some of the pits are within close proximity (see Map No. 2) of the Little Colorado River, which is ephemeral in this reach. A perennial reach ends approximately 80 miles upstream and another begins 30 miles downstream of Cameron. Water running into the pits do not contribute to surface flows in the Little Colorado River, although storm water running off the wastepiles may contribute to ephemeral flows in first, second, or third order tributaries of the Little Colorado River (Longsworth, 1994).

Three aquifers are recognized in the Cameron area. In descending order they are: 1) the alluvial aquifers composed of the sands and silts of the Little Colorado River and its tributaries, 2) the Chinle Formation, consisting of the Shinarump sandstone/conglomerate, and sandstone beds of the Petrified Forest member, and 3) the "C" aquifer, consisting of the Kaibab limestone, Toroweap formation, and Coconino sandstone (Cooley, et al., 1969)

Stormwater running off the wastepiles may provide some recharge to the alluvial aquifers in tributaries to the Little Colorado. Stormwater running into the pits may provide some recharge to the Chinle aquifer through subsurface fractures or along faults in the Petrified Forest Member (Longsworth, 1994).

Since the alluvium of the Little Colorado River intersects the other two aquifers in the Cameron region, the alluvium could function as a pathway for recharge to pass from the mines or the Chinle Formation into the "C" aquifer (Longsworth, 1994).

Most of the local recharge to the alluvial and Chinle aquifers is from direct infiltration of precipitation falling on outcrops, and from surface runoff (sheet flow) across outcrops. Since the basal outcrop of the "C" aquifer is bisected by the Little Colorado Gorge just west of the Cameron area, local gradient in the "C" aquifer is controlled by the gorge (Personal communication with Michael Foley, Navajo Nation Department of Water Resource Management, 1994).

Additional recharge occurs to the consolidated aquifers from the alluvium during flow events. This process is probably reversed to some extent during extended dry periods, when the consolidated aquifers probably discharge to the alluvium (Longsworth, 1994).

c. Vegetation: The vegetation type is described as Great Basin Desertscrub of the shadscale series (Brown, 1982). The area is a cold temperate desert in the rainshadow of the San Fransico Peaks, Coconino Plateau and the Kaibab Plateau.

Vegetation at these mine sites is limited to the native desert species and three exotic invaders: tamarisks (*Tamarix chinensis*) that locals call salt cedars, stands of camelthorn (*Alhagi camelorum*), and Russian thistle (*Salsola sp.*). The dominant types of vegetation in the area include the following: shadscale, broom snakeweed, camelthorn, indian ricegrass, blue grama, Hopi blanket flower, sunflower, annual buckwheat, Mormon tea, soapweed, salt cedar, foxtail barley and prickly pear cactus (Chischilly, 1993). At the mine sites, there is no hydric soil present, only mineral soil. Vegetation in the area is largely limited to areas where eolian deposited soil is available and in the flood plains of the washes that drain the area.

Wetland values near the project area are represented by the Little Colorado River and its tributaries. The river exhibits broad floodplains, well developed bosques consisting of tamarisk, camelthorn, some cottonwood trees, and native shrubs, forbs, and grasses. The river bed is 200 to 500 feet wide in the reach just before entering the Little Colorado River Gorge.

d. Fish and Wildlife Resources:

1. Threatened and endangered plant or animal species (Endangered Species Act): The Navajo Natural Heritage Program (NNHP), Biological Survey Services has identified (through data base search) only one specie that is listed as an endangered specie that occurs adjacent the project areas; that specie is the Humpback chub (*Gila*

cypha). The Humpback chub is known to exist in the lower Little Colorado River. In addition, one category 1 (parish alkali grass) specie and four category 2 (roundtail chub, ferruginous hawk, spotted bat, and Cameron water-parsley) may be found in or adjacent to the project area.

Two species of concern to the Navajo Nation and the Hopi Nation that are known to occur in the area. The two species are the golden eagle (*Aquila chrysaetos*) and the ferruginous hawk (*Buteo regalis*). The NNHP, Biological Survey Section, conducted a biological survey to determine the status of federally and tribally listed species that were considered threatened and endangered (T&E), candidate species, and species of interest. The Navajo Natural Heritage office included all three categories in their detailed study and report. The U.S. Fish and Wildlife Service (USFWS) was notified of all the NAMLRD projects in the Cameron mining district and a T&E list has been obtained from the USFWS.

2. Other wildlife in the area: There is abundant wildlife in and around the project sites. The wildlife includes native species and migratory species. The native wildlife that can be found are those plants and animals that are adapted to the temperate cold desert habitat of the area. In the winter time, migratory species that are visiting from the northern climes can also be found.

e. Soils: There are no areas within or adjacent to the project sites that are considered prime and unique farmland requiring protection under the Farmland Protection Policy Act.

f. Recreational resource values: The project areas are included in the Painted Desert scenic area that extends from north of Cameron to the southeast to the Petrified Forest National Park. Other scenic areas near or adjacent to the project area include the San Francisco Peaks to the south, the Grand Canyon National Park to the west, and Little Colorado Gorge Tribal Park, also west of Cameron.

g. Air quality (Clean Air Act): The project area is not located in any known special air quality zones. The air quality is excellent, except when the wind blows dust thereby interfering with visibility.

h. Noise: The existing environment where the project sites are located are in an area of quiet rural solitude. Noise from automobile traffic can be heard from nearby highway 89.

i. Topography: The elevation, near and around the project sites range from 4,026 to 4,411 feet above sea-level, and local relief in the area seldom exceeds 100 feet. The project sites east of the Little Colorado River are characterized by blue, gray and red mudstone, and tan and gray sandstone that are part of the lower part of the Petrified Forest Member of the Chinle Formation (Kirby, et al., 1992). One project site (NA-0166) west of the Little Colorado River is described as "... mottled to banded, red to tan, medium- to coarse-grained sandstone to conglomerate sandstones, assigned here to the upper part of the informally named sandstone and mudstone member" (Kirby, et al., 1992). The other sites (NA-0155a&b) west of river are described as being "... blue, gray, and redstone mudstone with subordinate tan and gray sandstone, assigned

to the basal portion of the Petrified Forest Member" (Kirby, et al., 1992).

j. Other resources: Since this project will be administered by the Navajo Abandoned Mine Land Reclamation Department pursuant to the Navajo Nation Reclamation Plan, Cameron AML Project 3 meets the Navajo Nation's plan to abate all hazards associated with past mining activities on the Navajo Nation. Likewise, the local community and residents are in favor of this reclamation project as they are concerned with the hazards of the abandoned uranium mines and its potentially delayed health effects.

The unincorporated community of Cameron, Arizona is the local center of commerce and social and cultural activities. The population of Cameron is approximately 1,700. Cattle ranching, sheep grazing, farming efforts and crafts manufacture are the predominate self-employment efforts. A small percentage of the Cameron area workforce is employed locally or in nearby towns. Major employers include the Bureau of Indian Affairs, Indian Health Service, the Navajo Nation, the local Coconino County and Arizona State governmental agencies, and private tourist-oriented businesses.

E. ENVIRONMENTAL IMPACT OF THE PROPOSED ALTERNATIVES:

Alternative 1: Issue an authorization to proceed with the proposed project.

1. Resource Values:

a. Historic, Cultural Resources, and Paleontological: Navajo Historic Preservation Department has issued a Cultural Resources Compliance Form that states the Archaeological Survey submitted for

this project by the Navajo Nation Archaeology Department will effect archaeological resources or historic properties; therefore, this reclamation project will have no effect on any of these resources or properties. However, the Hopi Tribe did express concern about eagle nesting sites about three miles from the project areas; This concern is addressed in the fish and wildlife values discussion.

Paleontological resources have been found and recorded in the wastepiles at several sites. This material has been examined by paleontologists and catalogued, and clearance was granted for the project. It is recommended that paleontological monitoring, salvaging and exclusion be implemented for most of the project sites. The following is a list of sites and their respective mitigating measures:

TABLE 3: SUMMARY OF RECOMMENDED MITIGATION*

SITE	SALVAGE	MONITORING	EXCLUSION	NO MITIGATION
NA-0155a	YES	YES	YES	n/a
NA-0155b	n/a	n/a	n/a	YES
NA-0163	n/a	n/a	YES	n/a
NA-0166	YES	n/a	n/a	n/a
NA-0172a	n/a	YES	YES	n/a
NA-0172b	n/a	YES	YES	n/a
NA-0173	n/a	YES	YES	n/a
NA-0174	n/a	n/a	n/a	YES
NA-0175	n/a	YES	YES	n/a
NA-0179	n/a	n/a	n/a	YES
NA-0180	n/a	n/a	YES	n/a

*from Table 1 of Results of the Third Paleontological Field Survey of Abandoned Mine Sites in The Navajo Nation Near Cameron, Arizona, 1992

With the implementation of the mitigation measures outlined in Table 3, the impact of the project to paleontological resources

should be reduced from moderate to minor in the short term and minor in the long term. See "Results of the Third Paleontological Field Survey of Abandoned Uranium Mine Sites in the Navajo Nation Near Cameron, Arizona", Appendix B for detailed information on the paleontological resources.

b. Hydrology: Using the proposed method of reclamation, the wastepiles with elevated levels of radioactivity and the stockpiled ore will be confined (sandwiched) between layers of relatively less radioactive or non-radioactive waste material; this will reduce the potential for radioactive particles becoming suspended in the runoff and sheet flow, thus reducing the contaminants in the feeder drainages of the Little Colorado River.

Since a great portion of the soil within the project sites are clayey, the proposed method of backfilling of waste materials, and the compaction by the heavy equipment will avoid infiltration or leaching of reclaimed materials into the water courses, surface and sub-surface.

Pits within the sites intermittently collect water during the rainy seasons and this water is consumed by livestock and wildlife. To reduce the impact of eliminating this contaminated source of water, the project will include the repairing of two existing water catchment structures that are in close proximity to all of the project sites.

The only floodplains near the project area are those of the Little Colorado River and, to a smaller extent, the washes that drain into the Little Colorado River. They will not be affected by the project.

The Phoenix office of the Regulatory Branch, Army Corps of Engineers was consulted about the project and a determination that are no "waters of the United States" within the project areas; therefore, there will be no impact.

With the above considerations, the impact of the project to the hydrological resources of the area will be minor for the term of the project and negligible in the long term.

c. Vegetation: The Army Corps of Engineers has determined that no wetlands are present (see letter from Army COE in Appendix A). In addition, NNHP, Biological Survey Section has determined the there will be no negative impact upon any plant species of concern in the vicinity of the project site. (See the T&E Species Survey and Biological Evaluation for detailed information.)

There will be no attempts made at revegetation of reclaimed sites due to costs and the quality of the soil. However, included in the final grading, shallow indentations will be left in the soil. This will help retard rill erosion on long slopes and will possibly be a place for eolian deposition of soils and in turn plant roots can take hold and assist "Mother Nature" in her revegetation.

The project will have negligible impacts and a minor impact will be made if the indentions made by the compactor become vegetated in the long term. The impacts will be minor throughout the reclamation construction project.

d. Fish and Wildlife Resources: According to the report titled "Threatened & Endangered Species Survey and Biological Evaluation", prepared by the NNHP, Biological Survey Section, eagles are

suspected to nest in the Black Point area which is approximately 2.0 miles from nearest project site. Since the nesting sites are of concern to the Hopi Tribe, they are addressed here. An additional survey was conducted by NNHP, Biological Survey Section in late March 1994 and NNHP biologists were unable to locate any nests or observe any eagles in the Black Point area. The survey also included locating any nesting ferruginous hawks; however, none were found. To further mitigate this concern, NAMLRD will not start construction of sites within a 2.5 mile radius of the Black Point area, during the breeding season for eagles (March 1st to August 31st) and additional monitoring will be conducted, **if** eagles are found to be nesting during the construction period. See "Threatened and Endangered Species Survey and Biological Evaluation" for NAMLRD Cameron AML Reclamation Projects 3 & 4, and "Threatened and Endangered Specie Survey and Biological Evaluation: Golden Eagle and Ferruginous Hawk" in Appendix C for additional information.

The report concludes that if the mitigation measures outlined in the "T&E Species Survey and Biological Evaluation" are followed there should be negligible impacts caused by the construction project and the survey for golden eagle and ferruginous hawk nesting concludes that no significant negative impact is expected; therefore, the short term impacts will be minor on all fish and wildlife resources and negligible on T&E listed species. The long term impacts of the project, on fish and wildlife resources, and threatened and endangered listed species, will be negligible.

e. Soils: Since, there are no known Prime and Unique Farm Lands in the project area, there will be no impact on this resource.

f. Recreational Resource Values: The unsightly disturbance caused by mining activity will be eliminated allowing for the scenic vistas to be returned to their more natural form. The visual beauty of the area will be enhanced. The beneficial impact will be minor in the short and long term, for the project will enhance the natural wonder that is the Painted Desert.

g. Air Quality and Noise: During the period of construction, the noise level and the dust in the air of the area will be elevated. The increased noise will be restricted to the area where construction is taking place and the dust will be controlled by dust suppression activities. Dust suppression activities will also help control the airborne radionuclides. Past AML construction projects in this area have shown that the above mentioned form of dust suppression has been effective and helps reduce airborne nuclides. The impacts to air quality will be minor during construction and negligible in the long term.

h. Topography: With the backfilling of the pits and removal of the highwalls, the topography will be changed. The change will be restricted to the project site boundaries. The final grading and slopes will blend in with the natural existing slopes and drainage. The impact will be minor in the short term and negligible in the long term.

i. Other resources: The contractor that is awarded the contract to do this work will be expected to hire in accordance with Navajo Preference in Employmnent laws. The Navajo people will benefit from the wages to be paid and money spent at local businesses.

The Navajo Nation Chapters of Cameron and Coalmine Mesa have passed resolutions in support of the reclamation project; hence, the wishes of the local residents and community leaders will be met. Likewise, the project is in conformance with the Navajo Nation Reclamation Plan and the Navajo Nation's plan to abate all hazards associated with past mining activities in Navajo Country.

The above socioeconomic factors impacted will be minor in the short term and negligible in the long term.

2. Cumulative Impacts

The cumulative impacts of Cameron AML Project 3 will be beneficial with more land being made available for grazing. In the short term, during construction and the natural rehabilitation period that will follow, the land will be unavailable for use by livestock and wildlife, but will not be restricted from access. The unsightly features of abandoned mine lands will be removed and the scenic vistas, which are part of the Painted Desert, will be enhanced. The visiting public, local citizens, livestock, and wildlife will be safe from the dangers of abandoned mines at the reclaimed sites. Cameron AML Project 3 is consistent with the Navajo Nation's plan to abate all hazards associated with past mining activities in Navajo Country and this project will be the third in a series of six planned reclamation projects within the former Cameron Mining District. This Project is also in accordance with the wishes of the voting members of the Cameron Chapter and Coalmine Chapter (the local governments) of the Navajo Nation.

Taking into consideration the discussion in the previous paragraph and the discussions in **D. Affected Environment** and the resource values under the environmental impacts of Alternative 1, the

overall impact of Cameron AML Project 3 will be minor in the short term during construction and negligible in the long term.

Alternative 2: Do not issue an authorization to proceed with the proposed project (No Action).

1. **Resource Values:** Under this alternative, the cultural, paleontological and historic values will not be impacted. The historical and cultural values of the paleontological resources will not be realized and will be lost in time due to the natural forces of weathering. The radionuclides will remain the same and continue to impact water quality and supply values due to surface runoff, and wildlife and livestock will continue to be impacted by their use of the impounded water and the potential for delayed health effects will increase with time. The fish and wildlife resources will remain the same and continue to be impacted by the hazards of the AML features described earlier. The scenic quality of the area will continue to be impacted by the unsightly abandoned mine features; the impacts of the AML features left unreclaimed may eventually return to a state of natural quality induced by natural forces, but this will take many, many years. This alternative will be contrary to the wishes of the voting members of the local chapters and the Navajo Nation for this alternative will not address present hazards associated with the AML sites. The benefits from the project to the Navajo Nation will not be realized, i.e. employment.

2. **Cumulative Impact:** The overall impacts, individual and cumulative, of this alternative, **Alternative 2: Do not issue an authorization to proceed with the proposed project (No Action)**, will continue to be moderate and the impact will remain moderate.

Alternative 3: Approve a differently-designed construction project.

1. Resource Values: Other alternatives which could be used to eliminate or reduce safety hazards and environmental harm are fencing or berming off the problem areas. Employing these alternatives, will neither eliminate nor reduce the safety hazards or the environmental problems. These alternatives, at best, will be short term in nature and will not return most of the affected land to beneficial use.

Employing the fencing of AML sites will cause no physical change in the Priority 1 problems. At best, this will be a temporary solution. The fence will not prevent wildlife access to the dangerous open pits and polluted waters nor will it prevent intentional human access to the highwalls and other dangerous features. Fencing will not prevent further accumulation of runoff water into the open pits. Safeguarding and maintenance of the fence or the integrity thereof in the remote areas will be costly, as theft and vandalism are highly probable. Environmental degradation will continue.

The alternative to berm off mine pits will prevent water from entering and accumulating in the open pits but only for the short term. But like Alternative 2, this is not a permanent solution to the problem, for the berms will be susceptible to erosion and will require periodic maintenance. This alternative will only address the polluted water issue.

2. Cumulative Impacts: The cumulative impacts will be similar to the impacts of Alternative 2, and based on the individual discussion of the two alternatives under Alternative 3, the short and long term impacts of Alternative 3 will continue to be moderate,

therefore is unacceptable to the Navajo Nation.

F. SUMMARY: The Navajo Abandoned Mine Land Reclamation Department, acting on behalf of the Navajo Nation, prefers to implement the proposed reclamation project per Alternative 1 of this document.

The reclamation plan under Alternative 1 will reclaim the affected lands, effectively address the affected resources that have been discussed in this document and will effectively mitigate the negative effects on resources. Alternative 1 is fully supported by the communities, the local chapters and the Navajo Nation government.

Though the two alternatives under Alternative 3 will address some of the concerns of the Navajo people, this alternative is unacceptable because it does not effectively address the problems and hazards of the AML features described in this assessment completely. The work to be done under this alternative presents a short term benefit and the AML features will continue to degrade the natural environment.

In conclusion, the Navajo Nation requests that the OSMRE, Albuquerque Field Office Director, issue a Finding of No Significant Impact to implement reclamation under Cameron AML Reclamation Project 3 using the preferred alternative.

G. PERSONS AND AGENCIES CONTACTED TO ASSIST IN THE PREPARATION OF THE ENVIRONMENTAL ASSESSMENT:

Person(s) Contacted	Organization or Agency
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Herb Yazzie, Attorney General (602) 871-4941	Navajo Department of Justice P.O. Box 308 Window Rock, AZ 86515
Akhtar Zaman, Director (602) 871-4941	Navajo Minerals Department P.O. Box 308 Window Rock, AZ 86515
Melvin Bautista, Director (602) 871-4941	Office of Navajo Land Admin. Division of Natural Resources P.O. Box 308 Window Rock, AZ 86515
Genevieve Hardy, Engineering Technician (602) 871-6401	Office of Navajo Land Admin. Division of Natural Resources P.O. Box 308 Window Rock, AZ 86515
James Peshlakai, President (602) 679-2323	Cameron Chapter P.O. Box 85 Cameron, AZ 86020
Harry Goldtooth, Grazing Committee Member (602) 679-8993	Coalmine Chapter P.O. Box 1464 Tuba City, AZ 86045
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H. APPROVAL:

Preparer by:

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Navajo AML Reclamation Department

Reviewed By:

S. Deb Misra
S. Deb Misra, Professional Engineer
Navajo AML Reclamation Department

Date: June 24, 1994

I. APPROVAL:

Bernadine Martin
Bernadine Martin, Director
Navajo AML Reclamation Department
P.O. Box #1875
Window Rock, AZ 86515-1875
602/871-6982

Date: 6/24/94

I. REFERENCES

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J. Appendices

Appendix A: Consultation Letters

Appendix B: Results of The Third Paleontological Field Survey of Abandoned Uranium Mine Sites Near Cameron, Arizona

Appendix C: Threatened and Endanger Species Survey and Biological Evaluation for: Navajo Abandoned Mine Land Reclamation Department project: Cameron Projects III and IV: Abandoned Uranium Pits

Threatened and Endanger Species Survey and Biological Evaluation: Golden Eagle and Ferruginous Hawk

Appendix D: FORM A Land User Consent: Consent to Entry for Reclamation.

Appendix E: Health Physics and Instrumentation Monitoring Plan

United States Department of the Interior

OFFICE OF SURFACE MINING
Reclamation and Enforcement
Suite 1200
505 Marquette Avenue N.W.
Albuquerque, New Mexico 87102

July 13, 1994

Ms. Bernadine Martin, Director
Abandoned Mine Land Reclamation Department
Division of Natural Resources
The Navajo Nation
P.O. Box 1875
Window Rock, Arizona 86515

Dear Ms. Martin:

The Office of Surface Mining Reclamation and Enforcement reviewed the environmental assessment (EA) for Cameron Project 3 and determined that it adequately discusses the environmental issues and impacts associated with the proposed reclamation. Based on analysis of this document and other pertinent information, I have determined that reclamation of this abandoned mine site will not have significant effects on the quality of the human environment. I conclude, therefore, that an environmental impact statement is not necessary. My conclusion is documented in the enclosed Finding of No Significant Impacts (FONSI).

Accordingly, pursuant to section 5-11-20.D.3 of the Federal Assistance Manual, the Navajo Abandoned Mine Land Reclamation Department (NAMLRD) is authorized to proceed with reclamation of this project subject to constraints recommended by the Navajo Fish and Wildlife Department and the U. S. Department of the Interior, Fish and Wildlife Service, to avoid impacting wildlife.

Please note that the list of NAMLRD's site inventory numbers in the FONSI does not include all the sites shown in the EA. The list in the FONSI corresponds to all project sites as they were consolidated into priority 1 sites in NAMLRD's September 23, 1993, revised grant submittal. All sites are covered by the FONSI. Please contact Daniel N. Martinez, Chief, AML & Grants Administration Branch at 505-766-1486 if you have any questions.

Sincerely,

Thomas E. Ehmett, Acting Director
Albuquerque Field Office

Enclosure

cc: Colleen Hamilton
Navajo Historic Preservation Office

FINDING OF NO SIGNIFICANT IMPACTS

Cameron Project 3
Abandoned Mine Lands Project
NA-0155, 0163, 0166, 0172a,
0172b, 0173, 0175, and 0180
Coconino County, Arizona
81038

The Office of Surface Mining Reclamation and Enforcment (OSM) thoroughly reviewed an environmental assessment (EA) prepared by the Navajo Abandoned Mine Land Reclamation Department (NAMLRD) and determined that it discusses the environmental issues and impacts of proposed reclamation of Cameron Project 3 sufficiently to enable OSM to authorize abandoned mine lands (AML) reclamation activities pursuant to an awarded AML construction grant.

Information reviewed by OSM includes: An EA dated June 24, 1994, prepared by NAMLRD; a list of species of concern dated June 25, 1992, compiled by the Navajo Fish and Wildlife Department (NFWD); a list of species of concern dated April 28, 1992, compiled by the U. S. Department of the Interior, Fish and Wildlife Service; a threatened and endangered species survey and evaluation, with recommendations, dated November 9, 1993, conducted by NFWD; a May 18, 1994, report of an April 19, 20, and 21, 1994, supplemental survey for golden eagles and ferruginous hawks, concluding there will be no effect on those species but with recommendations by NFWD; a March 28, 1994, letter from the Department of the Army, Corps of Engineers, acknowledging that no sites in the Cameron 3 project will require permits under Section 404 of the Clean Water Act; a report dated April 30, 1992, of a paleontologic field survey conducted by the Museum of Northern Arizona, with recommendations; a cultural resources compliance form signed by the Navajo Historic Preservation Officer on June 4, 1993, concluding that no historic properties are located in the project areas on the basis of May and June 1992 archaeological surveys conducted by the Navajo Nation Archaeology Department; a July 22, 1993, concurrence by the Arizona Historic Preservation Officer with the finding of no eligible properties; a letter of eligibility dated June 8, 1993, signed by the Navajo Nation Attorney General; the Navajo President's 409(c) request to Secretary Babbitt; a land verification dated June 2, 1993, by the Office of Navajo Land Administration; resolutions supporting reclamation by the Cameron and Coalmine Mesa Chapters dated September 26, 1992, and July 25, 1991, respectively; landuser consents to entry dated September 11 and 26, 1991, and February 12, 1993; a letter dated July 12, 1993,

from OSM to Hopi Chairman Masayesva notifying the Hopi Tribe of the proposed Cameron 3 project and affording the Hopi Tribe the opportunity to comment; and cost and workload data submitted in an application on June 22, 1993, and revised on September 23, 1993.

Based on the analysis in the EA and other documents referenced above, I find that reclamation of this abandoned mine site will not have significant effects on the quality of the human environment. I conclude, therefore, that an environmental impact statement is not necessary.

My specific reasons are as follows: No anticipated impacts on threatened and endangered species, provided the survey reports' recommendations are complied with; no properties located within the project areas that are listed, or eligible for listing, on the National Register of Historic Places; the absence of effects on riparian areas, jurisdictional wetlands, and prime farmlands; and no significant impacts on air or water resources or socioeconomic factors.

OSM concurs with the finding of no properties listed, or eligible for listing, on the National Register of Historic Places. OSM advises NAMLRD to comply with the recommendations of the consulted agencies stated in the documents referenced above. NAMLRD may begin work to reclaim Cameron Project 3 at its convenience upon receipt of this Finding and the accompanying Notice to Proceed subject to recommendations noted in the documents referenced above to avoid impacting golden eagles and ferruginous hawks and obtaining a permit from the U. S. Department of the Interior, Bureau of Reclamation, for the off-site work near NA-0166.

OSM Environmental Reviewer

AML Prg Spc
Title

7/13/94
Date

Thomas E. Ehmett, Acting Director
Albuquerque Field Office

7-13-94
Date